Title:

Human-Nature Relational Values through Time

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Overview:

Promoting the development of relational values for nature helps students to shape their own personal world view and is a key component in achieving a sustainable societal relationship with nature. This learning module is part of a series of activities designed to encourage students to develop relational values with nature and is designed for use in a broad spectrum of post-secondary classes. This learning module, in whole or part, has utility in any class that considers the relationship of humans with the environment, including courses in the natural sciences, social sciences, and humanities. In this activity, students complete a series of five worksheets that guide students to think critically about what is natural, gain perspective on the current, past and future human-nature relationship, and ultimately evaluate their own relationship with nature.

Relational values for nature are promoted when students:

- Think about their relationship with nature
- Consider how the human-nature relationship changes over time
- Reflect on the limits of human perception relative to other species
- Understand that everyone, including the instructor, has relational values for nature
- Know that relational values are held by individuals and can be considered collectively

Learning goals are met when students:

- Have a greater understanding of their own relationship with nature
- Evaluate their relationship with nature relative to other people
- Make connections between the subject matter and their lives
- Consider nature and sustainability goals when making decisions
- Discuss how the human-nature relationship has changed and continues to change

Instructor Guide

This activity is suitable for use in any post-secondary college course but is likely to be most useful in a course that is in some way directly related to the environment. The handouts provided in this document are intended to stimulate reflection and instructor-led in-class discussion. Portions of these worksheets could be assigned as homework in support of in-class discussion. The materials below could also be adapted to an essay format. The instructor should not hesitate to share their relational values with nature and/or dreams for the future with the class, but should be careful not to try to impose those views on students

Below is an outline of the instructional framework and guidance for class discussion for each part/question in the activity.

Instructional Framework:

This activity is designed utilizing a think-pair-share framework. Students answer the questions individually, compare and revise their answers in a small group, and then discuss their answers with the entire class in an instructor-led discussion.

For each part below, ask students to

1) Either answer or think about the questions individually
2) Assemble into small groups and discuss their answers
3) Arrive at a consensus answer for each question
4) Share their answers with the class
5) Instructor-led discussion

The class should complete the parts in a step by step fashion with instructor-led whole-class discussion occurring between parts. Sharing answers with the class can be accomplish in a number of ways, including verbally or with poster/white boards.

Part I: What is natural?

This section asks students to reflect on what the word "natural" means by leveraging debate over food packaging regulations in the United States of America.

Q1: This is a tricky question. It is difficult to write a good definition of "natural" that reflects all of the nuanced ways in which the term is used in modern society. Responses will likely be varied for this reason. Encourage students to integrate their own personal experience with the word into their definition. A common theme is that if something involves humans, it is not natural.

- Why did you answer the question this way? What factors contribute to answering the question the way you did?
- Has the definition of natural changed over time? Has is changed in your lifetime?
- Do you feel like you know what "natural" means without being able to write a definitive definition?

Q2: Students may say that "natural" foods are foods that grow in nature without being touched by humans. Other students may suggest all food is natural. Still others may argue that natural foods are those that are unprocessed or minimally processed. There is not a correct answer to this question. The goal here is demonstrate that it is hard to define the word "natural". In the United States of America neither the Food and Drug Administration (FDA) or Department of Agriculture (USDA) regulates use of the word "natural", meaning that any food product could be labeled as such so long as it does not contain artificial colors.

- Does domestication render a food non-natural?
- Are genetically modified foods natural?

Q3: Whether organic food is natural is likely to come up during the discussion of Q2. After discussing their answers in class, you may want to get students thinking about the various labels on food packaging, such as: natural, organic, 100% organic, and USDA organic. The United States Department of Agriculture regulates food production and food labeling and has regulated use of the word "Organic" on food labels and packaging since 2001. Organic foods are produced in a fashion that protects natural resources (e.g. water) and biodiversity and utilizes growing methods that are mostly (95%) free of toxic fertilizers, genetically modified organisms (GMO's), antibiotics, growth hormones, and artificial preservatives/colors. 100% organic contain none of these methods/ingredients.

- Are foods grown with the assistance of pesticides or herbicides natural?
- Does the method of growing/raising/producing food change whether it is natural?

Wrap it up:

- Why is it important to recognize how we (humans) define the word "natural"?

It is important to recognize that people differ in how they define what is natural and what is non-natural. Differences in the view/use of the term helps us understand the impact of humans on the world. Our view of "nature" and the "natural world" influences the way we interact with the world and its resources. Someone who considers "natural" to be something that is untouched by human society is going to interact with the world differently than someone who thinks "natural" things are simply non-human.

Additional Reading

The debate on the word "natural" on food labeling:
https://www.regulations.gov/docket?D=FDA-2014-N-1207

National Organic Program:
https://www.ams.usda.gov/rules-regulations/organic

Part II: The biases and limits of human perception

This section uses the concept of "home" as a device to introduce students to human speciesism and the biological limits of human perception.

Q4: Students are likely to be confused because the quote is given without context. Snyder's quote is in reference to the method and scale at which humans perceive the world without the assistance of technology. Our perspective of the world is shaped by our surroundings and our ability to perceive the world is impacted by being a human. Try asking a follow-up question, such as "what is a place?" or "have you visited a place?" if students have trouble getting started.

- How do humans perceive the world?
- Does our perception of the world differ between cultures?
- Has our perception of the world changed over time?

Q5: Student responses will be varied, but common themes include family, shelter, and safety. This question is meant to segue into Q6. It is a good idea to write the words on something that all of the students can see (e.g. white-board, typed on a projection). Try making a master-list that the whole class contributes to.

Q6: Some students will initially claim that home is a human construct while other students will immediately recognize that other species also have homes. Students may suggest that home is uniquely human because it is a place of family, shelter, language, and/or safety. For students who associate home with family, discuss the strong social bonds in African elephants. For students who emphasize shelter as a strong characteristic of home, discuss bees and their hives or spiders and their webs. For students who describe home as a place with a common language, try discussing communication in bees through dance. See additional reading below.

African Elephants have strong social bonds and spend their lives in herds. Herds are usually led by a matriarchal female and are composed mainly of related females. They work as a team to acquire resources, raise young, and defend their relatives. Like humans, they are large brained and intelligent.

Red dwarf bees build hives and use them for reproduction, safety, and the storage of food. Like humans, they have to relocate to a new home from time to time. The process of moving to a new hive involves "hive hunting", where scouts search for hive locations with good access to food resources but also a safe location where the colony will be able to successful raise offspring. Bees have their own language composed of a special dances that allow them to communicate the location of food sources.

- Does the word association from Q5 make sense for non-human homes?

Wrap it up:

- How do other species perceive the world?
- Do humans perceive the world in the best way, or do other species possess superior traits?

Humans build shelters and form complex social relationships in a place that we call home, but the need for such a place is not uniquely human, nor are the behaviors that contribute to the establishment of a home, despite the temptation to view them as such. Scientists frequently invoked the idea of home as a way to describe the ecology of other species (e.g. home-range, homing). Humans have developed technology to help us do a better job at understanding the world beyond our own scale of perception, but the sensory abilities we possess through adaptive evolution are massively inferior to those that other species possess through adaptive evolution (see Ruhl 2018 for additional class exercises on this theme). Examples include echo-location by bats, visual acuity coupled with observation from height in birds, olfactory acuity in dogs, geomagnetic navigation by turtles, electroreception in sharks, and the visual range of mantis shrimp.

Additional Reading:

The emerging science of social complexity: Kappeler, PM. 2019. A Framework for Studying Social Complexity. *Behavioral Ecology and Sociobiology*. 73:13.

Evolution and the human-nature relationship: Ruhl N. 2018. Are Humans Natural? Exploring human-nature relational values in an evolutionary context. *Rowan Digital Works: Open Educational Resources*, 7. https://rdw.rowan.edu/oer/7

Elephants: Archie EA and Chivo PI. 2012. Elephant behaviour and conservation: social relationships, the effects of poaching, and genetic tools for management. *Molecular Ecology*, 21:3, 765-778. DOI: 10.1111/j.1365-294X.2011.05237.x

Bees: Makinson, JC, Oldroyd, BP, Schaerf, TM., Wattanachaiyingcharoen, W, and Beekman, M. 2011. Moving home: nest-site selection in the Red Dwarf honeybee (*Apis florea*). *Behavioral Ecology and Sociobiology*. 65:5, 945-458.

Part III: Are humans natural?

This section combines and extends the previous discussion of the words "natural" and "home" to facilitate a discussion about whether humans are natural, or not.

Q7: Students will usually focus on the presence of humans in the painting in their answers to this question. "Kindred spirits" depicts a scene which appears to be a landscape painting of a real place, but is a fictional place created by combining the essential components of two real landscapes (Kaaterskill Clove and Kaaterskill Falls). The painting serves as a commemoration (analogous to a postcard or selfie) of the artist's trip to the Catskill Mountains and takes artistic license with depiction of reality/nature.

- Does the knowledge that this painting is not a faithful reproduction of reality change whether it is a natural scene?

Q8: If students get stuck on this question remind them of their word-association answers in the previous section (Part II) and ask them whether those words apply to the painting. The individuals in the painting do not appear to be dressed appropriately for the depicted environment and students frequently suggest that this means that they are not at home. Both individuals are dressed in clothes that are best suited for a city rather than the outdoors.

- If the humans are not dressed correctly, and are not at home, are the depicted humans natural?

Q9: Student answers to this question typically define nature as non-human. Students should be encouraged to share their perspectives in class. Some students may say nature are the areas of the earth unoccupied by humans and untouched by human development. Some students may say that nature is all the material things in the world.

- What is the difference between nature and natural?
- How is natural different than wilderness?

Wrap it up:

- Does the way you interact with nature influence whether you are natural?
- Do you have to be at home in nature in order to be natural?

Humans define "natural" in different ways and consequently have differing views on whether they are natural or not. Whether humans are natural or not can be seen as a problem to be solved by natural scientists, epistemologists, and/or geographers depending on your viewpoint and is an active area of inquiry in academia. Some authors (including the authors of this learning module) suggest that whether humans are natural can and should be considered (e.g. Paterson, 2006; Williams 2007, Tidball 2012), but other authors disagree and do not think considering whether humans are natural is a productive or useful activity (e.g. Proctor, 1998; Keeling, 2008). Still others suggest that humans are both natural and non-natural or that we exist in a dualist state of "human nature" (e.g. Hamilton, 2002; Jacobs, 2018). It is worth noting that key to the argument of authors such as Keeling (2008) is that the words "natural" and "nature" are anthropogenic and do not really exist whereas "wilderness", a place devoid of humans, is what we really mean when we say "natural". Our position is that, from a scientific/technical perspective, all places (ecosystems) on Earth are impacted by humans, so it is actually "wilderness" that no longer exists.

Additional Reading

Hamilton C. 2002. Dualism and sustainability. *Ecological Economics*, 42:1-2. 89-99.

Jacobs JM. 2018. The metaphysical nature of personhood and the need for analogy. *Heythrop Journal*, 59:4, 707-720.

Keeling PM. 2008. Does the Idea of Wilderness Need a Defence? *Environmental Values*, 17:4, 505-519.

Paterson B. 2006. Ethics for wildlife conservation: Overcoming the human-nature dualism. *Bioscience*, 56:2, 144-150.

Proctor JD. 1998. The social construction of nature: Relativist accusations, pragmatist and critical realist responses. *Annals of the Association of American Geographers*, 88:3, 352-376.

Tidball KG. 2012. Urgent Biophilia: Human-Nature Interactions and Biological Attractions in Disaster Resilience. *Ecology and Society*, 17:2.

Williams J. 2007. Thinking as natural: another look at human exceptionalism. *Human Ecology Review*, 14:2, 130-139.

Part IV: How have humans changed over time?

The purpose of this section is to encourage students to reflect on how humans have changed over time from both an evolutionary and a technological perspective. This activity assumes students have a background in evolutionary theory, so students without such a background should have additional instruction prior to conducting this part of the activity. Consider a discussion of mechanisms that drive evolution, including genetic drift, natural selection, and gene flow. Evolution is a change in gene frequencies in a population over the course of several generations.

Genes are the genetic code controlling many individual characteristics or traits, so the frequency at which genes occur dictates, in large part, the frequency at which individual characteristics or traits exist in a population. The frequency of a gene can increase or decrease due to selection (including natural, sexual, and/or artificial selection), genetic drift, gene flow, and/or genetic mutation. Natural selection is the evolutionary process whereby certain individuals have traits that are better suited for their environment, and thus have a better chance at reproductive success compared to other members of the same species. Over many generations, selection favors genotypes with the most advantageous traits and other genotypes die off, causing the gene frequency of a population to change and evolution to occur.

Q10: Allow students to generate ideas for each section of the table individually before working with a partner or small group. The instructor should provide the students with additional instruction to help students to conceptually understand the time scales, so it is a good idea to intervene with a short explanation/lecture about the time-scales before moving on to small group discussion. After orientation to the scales of human-history, allow students to compare their answers in small groups. Some answers from the individual exercise will need to be changed and it is likely that, working together, students will be able to think of new/better answers. Bring the groups together into a larger discussion by creating an edited master-list that everyone can see (i.e. on the whiteboard or projector).

Wrap it up

- What factors facilitated the change in humans over time?
- Are there any trends that you see occurring over time in the table?
- How do you think humans will change in the future?

Millions of years: The most recent common ancestor between humans and apes is currently understood to be *Sahelanthropus tchadensis*. *S. tchadensis* lived 6-7 million years ago, had more ape-like anatomy, walked upright, and had smaller canines compared to modern humans. Human evolution occurred over the course of 5-7 million years and mostly occurred in what is now called Africa. It is estimated that 15-20 different "human" species existed (members of the genus *Homo*) in the past. Over the course of human evolution bipedalism developed, diet shifted from herbivore to omnivore, and range expansion occurred.

Thousands of years: Later members of *Homo sapiens* exhibited deeper cognitive skills and complex social behavior. Ancient humans began to form complex social bonds, care for the elderly, and bury their dead. There is evidence that ancient humans planned into the future and had an increasing capacity for logic. Over this period humans learned to build fires, make weapons, cook meat, use language and symbols to communicate, and expanded their home range over much of the world.

Hundreds of years: Over the past hundreds of years, humans have successfully colonized every imaginable terrestrial habitat/ecosystem on the planet. The population size of humans has grown dramatically through technological innovation, modification of natural-ecosystems into agroecosystems, and the extraction of energy-rich fossil fuels from underground deposits. Human population growth and activities have caused concurrent global change in temperature, water availability, and the extinction rate of non-humans.

Additional Reading:

Buckeridge JS. (2009) The ongoing evolution of humanness: perspectives from Darwin to de Chardin. S Afr J Sci.105:427–31.

Gamble C. (2013) Settling the Earth. Cambridge University Press

Part V: How has the human-nature relationship changed over time?

Q11: Allow students to brainstorm in their groups. The instructor should monitor the students to ensure that the groups are not stuck on this question and have arrived at a reasonably correct answer. The human-nature relationship is possessed at an individual level (as opposed to the level of the species), varies from person to person, and describes the connection (whether it be monetary, spiritual, cultural, etc.) between a human and the environment/non-human collective. This question could be discussed as a group if the instructor feels it is warranted but the purpose of this question is to establish a frame of reference for the other questions in the Part V.

Q12: The obvious answer to this question is "Time". While this is true and is the topic/factor that this learning module explores, encourage student to be more specific. In addition to "Time", students might also offer that humans differ by "Space" or geography and should again be encouraged to be more specific. Below are some examples of common answers with the typical defense. Ask students to share/defend their answers with the class by answering the following question:

- Which factor is most important to changing the human-nature relationship?

Time: Earth has changed over time, so the interaction between humans the environment has as well. As climate or environment changes, humans adapt.

Evolution, Cognition, Ecological Niche: As humans evolved, their diet changed to be protein-rich and cognitive skills were selected for. As humans gained cognitive skill, they began to use resources in their environment to build shelters, make fires, obtain better/different food, and make weapons. As humans evolved, their ecological niche changed.

Socioeconomic Factors: During the industrial revolution, new machines and the use of fossil fuels drastically changed human lifestyle. Prior to the industrial revolution, items were typically hand crafted and humans relied heavily on wind, water, and wood for manufacturing. Engines allowed for the mass production of items in a short period of time, increased crop yields, and decreased the cost of goods. As humans lead an increasingly artificial life driven by socioeconomic and political concerns the natural world becomes less important in to everyday life.

Space: Differences in the human-nature relationship exist between cultures, so the culture within which a person is raised contributes to their personal relationship with nature. Differences in cultural practices are reinforced by a decrease in cultural exchange (isolation) and are most apparent when cultures exist in spatially distinct locations. Factors that contribute to spatial

differences in the human-nature are often driven by natural variability (e.g., seasonal, droughts) in the local environment and how people acquire food/shelter/water in that environment.

Social Movements: Degradation of nature by human activities paired with an increasing ability of humans to quantify their effect on the function of the global ecosystem has resulted social movements aimed at mitigating the impact of human activities. These social movements are a recent phenomenon and adherents are often considered environmentalists.

Q13: If students are stuck on this question ask them to think about current events. During the class discussion, some students may mention the resources humans obtain from nature such as: fuel, food, water, and other materials. Ask students to consider their answers to Q11 and emphasize that while each person has a relationship with nature, our collective/cultural relationship with nature is also important and it is the larger group relationship that we are interested in for this question.

- How do groups of people differ in their relationship with nature?
- What groups of people differ in their relationship with nature?
- What cultural or environmental factors contribute to the formation of these groups?
- Which groups have the "right" relationship with nature? Can anyone have the "right" relationship with nature?

Variation in religious beliefs, cultural practices, education, and economics all introduce differences in a given person's relationship with nature. There may be strong opinions from students on what the "right" relationship with nature is in broader terms (e.g., a relationship that is sustainable), but there is no "right" relationship and variation between people and cultural groups is both acceptable and normal.

Q14: Some students will readily report that their relationship with nature has changed overtime whereas other students will have difficulty with the question because they do not feel like they have ever had a connection with nature. The later situation is most common in students that grew up in urban environments. If students are having difficulty with this question the instructor should remind them that even the inner city is subjected to environmental variability and everyone can answer this question. Ask students to share their thoughts with the group.

- How has your personal relationship with nature changed over time?

Q15: Students may say their relationship with nature isn't important to them while others report it is very important to them. Some students may even say that their relationship with nature is neutral and that it is not something they think about. Leverage differences in how students answer this question to have a discussion.

- Why do some people think the human-nature relationship is important while other do not think it is important?
- Is one relationship with nature better than another?
- Do you have the relationship with nature that you want?
- How do you get the relationship with nature that you want, if you don't have it already?
- Why do you want a different relationship with nature? Why don't you want a different relationship with nature?

These can be deeply personal questions for some people. Students should be allowed to share with minimal pressure from the instructor and if they do not want to publicly share, they should not be required to do so. The goal is for students to consider/share their own personal beliefs/values instead of feeling pressured into espousing the view that they think the instructor wants them to adopt. It would be very beneficial to the students for the instructor to share their own personal relationship with nature, but the instructor should be careful to emphasize that their own relationship is not the "correct" relationship.

Wrap it up:
Personal one-on-one feedback via a written assignment on the above questions (from Q15) may be a good capstone to the learning module that is beneficial to all students.

Additional Reading:

Buckeridge JS. (2009) The ongoing evolution of humanness: perspectives from Darwin to de Chardin. S Afr J Sci.105:427–31.

Seymour V. 2016. The human-nature relationship and its impact on health: a critical review. *Frontiers in Public Health*, 4:260.

Human-Nature Relational Values through Time

Names: _____

Work with your group to complete each part of this exercise. Discuss each question amongst your group BEFORE recording your answers in the space provided. After you complete each part, we will come together as a class to discuss your answers. ***This handout will be returned to the instructor at the end of class today for grading.***

Part I: What is natural?

1. Write a definition of the word **NATURAL**.

2. When we refer to food as "natural", what do we mean? Does this fit with your definition above?

3. Is "organic" food different than "natural" food? Why or why not?

Part II: The biases and limits of human perception

"The world is places" – Gary Snyder

4. What do you think the quote from Snyder means?

5. When you hear the word **HOME**, what do you think of? List some words you associate with "home".

6. Is "home" a human construct? Do you think other organisms experience the world in a similar way to you?

Part III: Are humans natural?

Answer the following questions about Asher Durand's "Kindred Spirits" painting.

7. Does the painting depict a **NATURAL** scene? Defend your answer. Does your answer fit with your definition of natural?

8. Do the people appear to be at **HOME** in the scene? Defend your answer.

9. What does the word **NATURE** mean? Write a definition. Be sure that your definition for "nature" is not exactly the same as your definition of "natural" in Q1.

Part IV: How have humans changed over time?

10. Brainstorm ways in which humans have changed over the course of:

Millions of Years	Thousands of Years	Hundreds of Years

Part V: How has the human-nature relationship changed over time?

11. What is a human-nature relationship?

12. What factors have changed the human-nature relationship?

13. What is the current relationship of humans with nature? Is it good or bad? Do different types of people have different relationships with nature?

14. Has your relationship with nature changed over your lifetime?

15. Is your relationship with nature important to you? Does your relationship with nature influence other aspects of your life? Explain your answer.